Systron Donner 115 Pulse Gen

By G8MNY (Updated Aug 20)
(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

I bought one of these pulse generators at a rally (it matched my RF sig gen). It is a 19" 2U rack unit with yellow panels & side carrying handles.

FRONT PANEL

```
        RATE       DELAY       WIDTH      + Out    Levels   - Out
 ___________________________________________________________________
│ ┌───────────────────────────────────────────────────────────────┐ │
│ │                                       ( )    ██     ██    ( ) │ │
│ │     (O)         (O)         (O)              ██     ██        │ │
│ │                                              ██     ██        │ │
│ │ [ ▄]      [▄ ]     [ ▄]               ( )    ██     ██    ( ) │ │
│ │----------------------------------------------██-----██--------│ │
│ │ (·) 0     (·)       (·)      Ý  o      Ý    (·)  Ý  (·)    Ý  │ │
│ └───────────────────────────────────────────────────────────────┘ │
 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
    Ext     Enable      Sync    Power    Base    +  Comp  -    Base
    In        In        Out              Gnd    Out      Out   Gnd
```

SPECIFICATION

It generates signals from 0.5Hz - 25MHz, 8 decade variable timebase RATE.

Pulse Delays & Pulse Widths from 100nS - 5S, 8 decade variable. As well as fixed ratio square wave (to 25MHz).

It has 3 main controls, RATE, DELAY, & WIDTH.

There are 2 inputs for triggering & pulse enable.

There is a 50Û 2V pulse sync output for locking up to the start of the pulse/delay.

The two BNC 50Û outputs give +/- pulses & can be switched to complementary (invert pulse sense). The outputs have switched & variable high power output attenuators (2W) to give 5V, 2V, 1V, & 0.5V terminated, as well as optional DC offset +1 to - 5V. (e.g. offset the 0 & -5V pulse to +5V & 0V)

PULSE SHAPES

```
             Single Pulse Mode                   Double Pulse Mode
Sync Pulses at              +2v
Repeat RATE ___|___________|___________0v     ___|_____________|_________

DELAY time     |───|       |───|                 |───|         |───|

WIDTH time         |─|         |─|               ||  ||        ||  ||
                   ┌─┐         ┌─┐+5V            ┌┐  ┌┐        ┌┐  ┌┐
+ve Pulse    ______│ │_________│ │_0v         __││__││________││__││___

-ve Pulse    ──────┐ ┌─────────┐ ┌─0v         ──┐┌──┐┌────────┐┌──┐┌───
                   │_│         │_│-5v           ││  ││        ││  ││
```

INSIDE

There are 2 large PCBs filling the whole unit, one has the PSU for 3 power rails 5V & ±15V & all the pulse generator electronics.

```
          heatsink
 ____ÌÌÌÌÌÌÌÌÌÌÌÌÌÌÌÌÌÌÌ________.-----._
|     +5V  +15V  -15V | DC  -*|  Trans- |
|         V*          | corr- |  former |
|(·)()   ()     ()    |ection |_________|
|           P S U     | bias  | '-----' |
|                     | amps   ~~~~~~~~~|
|                     |    +*       0*  |
| Pulse Generators    |   +ve     -ve   |
|                     |  Pulse    Pulse |
| F*    D*    W*      |   amp     amp   |
| [ ]  [ ]  [ ]       |                 |
| ─┼─  ─┼─  ─┼─       | -load     +load |
| _|_  _|_  _|_       | DC amp   DC amp |
|__|____|____|__________________________|
   |    |    |
```

V* = set +15V
-* = set -ve pulse -5V ref
0* = set -ve pulse 0V height
+* = set +ve pulse 5V height
F* = set Max rep frequency
D* = set shortest delay time
W* = set shortest width time

The 2nd PCB has a very complex pair of current limited output amps using 16 heatsinked HF pulse transistors & 5 DC correction op-amps for each of the two 50Û outputs.

USES

Scope calibration of attenuators as the pulse shapes have very wide bandwidth. Coax cable testing, & demonstrating pulse shape-spectrum on spectrum analyser, clearly shows why digital QRM is so bad!

FAULTS

Initially it all appears to be working, although a main soothing capacitor had been poorly replaced. Systron Donner kit often fails with main smoothing going open circuit (been there done that!)

The -ve output occasionally has a DC fault, eventually proved to bad PCB soldered link throughs on the +15V rail to the DC load amp, on this complex variable/floating output amp biasing.

See my buls on "A Versatile Pulse Tester", "Spectrum Harmonic Demo circuit". "Variable RF Attenuator" & "Systron Donner 1702 SIG Gen".

Why don't U send an interesting bul?

73 De John, G8MNY @ GB7CIP